Shaw Tacoma
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SPECIFICATION[1]

IN two recent papers[2] we have discussed events of the known world as transactions. We wish now to consider that process of linguistic determination, freed from certain of the presumptions of symbolic definition, by means of which transaction is identified: the process, namely, of Specification.[3]

Specification, in our provisional terminology, is the most efficient form of designation, and Designation is that procedure of naming (forming the great bulk of linguistic process) which lies intermediate between the early perceptional processes of Signaling, and the later more highly specialized and more intricately involved processes of Symboling.

It will be recalled that we have inspected Fact most generally as involving and covering at once and together the naming process and "that" which the naming is about.[4] The choice of the word "fact" was made to name the most general transaction of "knowledge," because in practically all of its many varied uses this word conveys implications of the *being known* along with those of the *what* that is known; moreover, Fact applies to that particular region of the many regions covered by the vague word "knowledge" in which namings are the prominent feature. It is in this region that "knowledge" is most generally considered to be "knowledge of existence" in about the only sense of the word "existence" which has practical utility—that, namely, in which the existence is being affirmed with a considerable measure of security as to its details.

Taking Fact as inclusive of both the naming and the named in common process, we adopted Designation for the naming phase of

[1] We wish to express thanks to Jules Altman for various examinations of materials he has made for us, and equally for his helpful comments.

[2] "Interaction and Transaction," this JOURNAL, Vol. XLIII (1946), pp. 505–517, and "Transactions as Known and Named," this JOURNAL, Vol. XLIII (1946), pp. 533–551.

[3] We shall continue, as heretofore, to capitalize some of our main terms where stress on them seems needed, and particularly where what is in view is neither the "word" by itself nor the "object" by itself, but the general presentation of the named-as-in-naming.

[4] This JOURNAL, Vol. XLII (1945), pp. 225–247.

the transaction, and Event for the phase of the named. Events (or "existences," if one is prepared to use the latter word very generally and without specialized partisan stress) were distinguished as Situations, Occurrences, and Objects; and Objects were then examined in their presentations as Self-actions, Inter-actions, and Trans-actions—all of this, of course, not as formal classification, but as preliminary descriptive assemblage of varieties.

When we now turn to the examination of the processes of Designation we must on the one hand place designation definitely within the evolutionary range of behaviors; on the other hand we must examine the stages of its own development, leading up to Specification as the most efficient and the most advanced. The first of these tasks is necessary because a disjunction without a conjunction is usually more of a deception than of a contribution; but the pages we give to it furnish no more than a sketch of background, the further and more detailed treatment being reserved for another place and for a different connection.[4a]

Designation, as we have said, covers naming. "Naming" would itself be an adequate name for the processes to be considered under Designation—and it would be our preferred name—if the name "name" itself were not so tangled and confused in ordinary usage that different groups of readers would understand it differently, with the result that our own report would be largely *mis*-understood. For that reason, before going further, we shall insert here a few paragraphs about the common understandings as to "name," and as to their difference from the specialized treatment we introduce as Designation. Some of these positions have been discussed before, and others will be enlarged upon later.

Naming we take as behavior, where behavior is process of organism-in-environment. The naming type of behavior, by general understanding so far as present information goes, is one which is characteristic of *genus homo* in which almost alone it is found. Except as behavior—as living behavioral action—we recognize no

[4a] The word "definition" is used throughout the present paper, as in preceding papers, to stand for procedures of symboling as distinct from those of designating. This choice was made mainly because recent developments of technique, such as those of Tarski, Carnap, and symbolic logicians generally, have either adopted or stressed the word in this sense. After the present paper, however, we shall abandon this use. In preparing our succeeding paper, to appear under the title "Definition," we have found such complex confusions that misunderstandings and misinterpretations seem to be inevitable, no matter how definition is itself "defined." The effect of this change will be to reduce the word "definition" from the status of a "specification" to that of a "characterization" as this distinction is now to be developed.

name or naming whatever. Commonly, however, in current discussions, name is treated as a third type of "thing" separate both from organism and from environment, and intermediate between them. In colloquial use this makes little difference. But in the logics and epistemologies, a severed realm of phenomena, whether explicit or implicitly introduced, matters a great deal. Such an intervening status for "name," we, by hypothesis, reject.

Name, as a "thing," is commonly spoken of as a tool which man or his "mind" uses for his aid. This split of a "thing" from its function is rejected. Naming is before us not as a tool (however it may be so described from limited viewpoints), but as behavioral process itself in action.

Treatments of name as thing or tool accompany (or are accompanied by—the point is not here important) the splitting of "word" from "meaning"—"word," whether crudely or obscurely, being taken as "physical," with "meaning" as "mental." The split of a sign-vehicle from a sign, stressed as one of maximum theoretical importance in certain recent efforts at construction in this general field, is merely the old rejected split in a new guise. Under the present approach such a treatment of name, or of any other word, is regarded as deficient and inefficient, and is therefore banished.[5]

Under the above approach naming is seen as itself directly a form of knowing, where knowing is itself directly a form of behavior; it is the naming type of knowing behavior (if one wishes to widen the scope of the word "knowledge"), or it is the distinctive central process of knowledge (if one prefers to narrow the scope of the word "knowledge" thus far). Our hypothesis is that by treating naming as itself directly knowing, we can make better progress than in the older manners.

Naming does things. It states. To state it must both conjoin and disjoin, identify as separate and identify as connected. If the animal drinks, there must be liquid to drink. To name the drinking without providing for the drinker and the liquid drunk is unprofitable except as a tentative preliminary stage in search. Naming selects, discriminates, identifies, locates, orders, arranges, systematizes. Such activities as these are attributed to "thought" by an older form of expression, but they are just as properly at-

[5] The issue here is not one of personal "belief," whether pro or con. It is one of attitude, selection, decision, and broader theoretical formulation. Its test is coherence of achievement. *Practical* differentiations of specialized investigation upon half a dozen lines with respect to word, or along half a dozen other lines with respect to word-meaning, are always legitimate, and often of great practical importance.

tributed to language when language is seen as the living behavior of men.[6] The talking, the naming, is here oriented to the full organic (currently "organismic" or "organismal") process rather than to some specialized wording for self, mind, or thinker, at or near, or perhaps even *as*, a brain.

All namings are positive. "Not-cow" is as much positive naming as is "cow"—whatever the cow itself might think about that. The cow's local point of view does not govern all theoretical construction.

Written names are behavioral process as much as are spoken. Man's diminishment of the time-period, say, to the span of his day or of his life, does not govern decision as to what is behavioral or what is not.

The "what" that is named is no fiction. "Hercules" was a name in its time for something existently cosmic or cultural. It may be extinct as a name today. So are the trilobites, but they are none the less animal for that.

These viewpoints that we have set down are not separates fortuitously brought together. They are transactional. They form, for this particular region of inquiry, the substance of what is meant by "transaction" in our use. That they will not "make sense" from the inter-actional point of view, or from the self-actional point of view, is only what is to be expected. They make sufficient sense as fact to be usable by us in hypothesis, and the test of their value will be in the outcome of such use.

If we are to examine Designations as behaviors, we must first establish the characteristics of behavior as we see it. That the name "behavior," however elsewhere used, can, in biological studies, be applied without misunderstanding to certain adjustmental types of animal activities, will hardly be disputed. That a behavioral statement in this sense is not itself directly a physiological statement, nor a physiological statement itself directly a behavioral one, will likewise hardly be disputed, as matters stand today, however much one may hope or expect the two forms of statement to coalesce some time in the future, or however valuable and indeed indispensable the primary understanding of the physiological may be for any understanding of the behavioral. Extend either form of statement as far as you wish, holding it closely

[6] However, if language is not regarded as life-process by the reader, or if thought is regarded as something other and higher than life-process, then the comparison in the text will not be acceptable to him.

within its own vocabulary; it will, nevertheless, not directly convert itself into the other. Moreover attempts to limit the application of the word "behavior" to the overt muscular and glandular activities of an organism in the manner of a generation ago have not proved satisfactory. Too much development in terms of the participation of the "whole organism"—or, better said, of "the rest of the organism" has of late been made; and recent attempts to revive the older narrow construction for the interpretation of knowledge have had misfortunes enough to serve as ample warnings against such programs.

We shall take the word "behavior" to cover all of the adjustmental activities of organism-environment, without limiting the word, as is sometimes done, to overt outcomes of physical or physiological processes. This latter treatment involves too crude a disregard of those factual processes which in older days were hypostatized as "mental," and which still fall far short of acquiring "natural" description and reports. In the older psychologies (and in many still with us), whether under "mental" or "physiological" forms of statement, the distinction of the typically human behaviors from non-human and also of behaviors generally from the non-behavioral, was made largely in terms of "faculties" or "capacities" assumed to be inherent in the organism or its running mate, the "mind" or "soul." Thus we find "purposiveness" stressed as the typically "animal" characteristic; or accumulations of complexly-interrelated habits, or certain emotional, or even moral, capacities. In our case, proceeding transactionally, nothing, so far as we know, of this "capacitative" manner of statement remains in stressed use at critical points of research. Regarding behaviors as events of organism-environment in action, we shall find the differentiation of behavioral processes from physical or physiological to rest upon types of action that are observable directly and easily in the full organic-environmental locus.

Sign. Behaviors show a type of indirection in their process that is not found in physical or physiological processes. This is their characteristic. The word "indirection" may, no doubt, be applicable to many physiological processes as compared with physical, but it is not the word by itself that is important. The particular type of indirection that is to be found in behaviors we shall call *Sign*, and we shall so use the word "sign" that where sign is found we have behavior, and where behavior occurs sign-process is involved. This is an extremely broad usage, but we believe that, if

we can make a sound report on the factual case, we are justified in applying the word as we do.[7]

At a point far down in the life-scale Jennings identified sign as a characteristic behavioral process forty years ago. He was studying the sea-urchin, and remarked that while it tends to remain in dark places and light is apparently injurious to it, "yet it responds to a sudden shadow falling upon it by pointing its spines in the direction from which the shadow comes." "This action," Jennings continues, "is defensive, serving to protect it from enemies that in approaching may have cast the shadow. The reaction is produced by the shadow, but it *refers*, in its biological value, to something behind the shadow."[8]

This characteristic of Sign is such that when we have followed it back in protozoan life as far as we can find traces of it, we have reached a level at which we can pass over to the physiological statement proper and find it reasonably adequate for what we observe as happening. This makes the entry of the "indirection" which we call "sign" a fair border-line marker between the physiological and the behavioral. The sign-process characterizes perceptions all the way up the path of behavioral evolution; it serves directly for the expanded discussion of differentiated linguistic representation; it deals competently with the "properties" and the "qualities" that have for so long a time at once fascinated and annoyed philosophers and epistemologists; it can offer interpretation across all varieties of expressive utterance up to even their most subtle forms. All these phases of behavior it can hold together simply and directly. (When we come to the differentiation of Symbol from Name, and the establishment of Symbol as itself sign-process, further exposition will be needed, but this task is postponed for the present.)

[7] The *Oxford Dictionary* has twelve main dictionary definitions of sign, and a number of sub-divisions. The *Century* has eleven. In modern discussion the uses are rapidly increasing, but no one usage is yet fixed for the field we are at work in. Usages range from saying that sign is a form of energy acting as a stimulus, followed by the application of the word for almost any purpose that turns up, to presenting it as a product of mind-proper. No one use can claim the field till it has been tried out against others; and certainly no candidate should even enter itself until it has been tried out in its own backyard and found capable of reasonably coherent usage.

[8] H. S. Jennings, *Behavior of the Lower Organisms* (1906), p. 297. Jennings has himself never made a development in terms of sign, despite the highly definite description he so early gave it. Karl Bühler, who was one of the first men to attempt a broad use of a sign-process for construction, quoted this passage from Jennings (*Die Krise der Psychologie*, 1927, p. 80) at about the time it began to attract attention among psychologists in the United States.

Having adopted an interchangeability of application for sign and behavior, our position will be as follows: If we fall away from it, that fact will be evidence of defect in our development; if we fall seriously away that will be indication of an insecurity in our basic hypotheses themselves; if we can maintain it throughout—not as *tour de force* but as reasonably adequate factual statement—this will furnish a considerable measure of evidence that the manner of construction is itself sound.

We have indicated that behavior is envisaged transactionally and that sign itself is a transaction. This means that in no event is sign in our development to be regarded as consisting of an "outer" or detached "physical" thing or property; and that in no event is it to be regarded as the kind of an ear-mark that has no ear belonging to it, namely, as a detached "mental thing." Sign, as we see it, will not fit into a self-actional interpretation at all; nor will it fit into an interactional interpretation.

If this is the case an important question—perhaps the most important we have to face—is the exact location of sign. Precisely *where* is the event that is named when the name "sign" is applied? Sign is process that takes place only when organism and environment are in behavioral transaction. Its locus is the organism and the environment and the intervening region taken all together. It is these in the duration that is required for the event, and not in any fictive isolation apart from space, or from time, or from both. A physiologist, studying breathing, requires air in lungs. He can readily, however, temporarily take for granted the presence of air, and so concentrate his own attention on the "lungs"—on what *they* do—and then make his statement in that form. He can, that is, for the time being, profitably treat the transaction as interactional when the occasion makes this advantageous. The student of the processes of knowings and knowns lacks this convenience. He can not *successfully* make such a separation at any time. Epistemologies that isolate two components, that set them up separately and then endeavor to put them together again, fail; at least such is our report on the status of inquiry, and such our reason for proceeding transactionally as we do.

It is evident that time in the form of clock-ticks and space in the form of foot-rules yield but a poor description of such events as we report signs to be. Treat the events as split into fragments answering to such tests as clocks and rules may give, and you have a surface account, it is true, but one that is poor and inadequate for the full transaction. Even physics has not been able to make the advances it needs on any such basis. The spatial habits of the electrons are bizarre enough, but they are only the prologue.

When physicists find it practicable to look upon 92 protons and 142 neutrons as packed into a single nucleus in such a way that the position of each is "spread out" over the entire nuclear region, certainly it should be permissible for an inquirer into man's behavioral sign-processes to employ such pertinent space-forms with pasts and futures functioning in presents as research plainly shows to be necessary if observation is to be competent at all. At any rate any one who objects to freedom of inquiry in this respect may properly return to his own muttons, for subsequent proceedings will not interest him at all.

Taking Sign, now, as the observable mark of all behavioral process, and maintaining steadily transactional observation in replacement of the antique fixations and rigidities, we shall treat Signal, Designation, and Symbol [9] as genera of signs, and so of behaviors. Similarly within the genus Designation, we may consider Cue, Characterization, and Specification as species. In this we shall use "genus" and "species" not metaphorically, but definitely as natural aids to identification.

Signal. All the earlier stages of sign up to the entry of language we group together under the name "signal." Signal, this is to say, covers the full sensori-manipulative-perceptive ranges of behavior, so far as these are unmodified by linguistic behaviors. (Complex problems of linguistic influencings will surely have to be faced at later stages of inquiry, but these need not affect our terminology in its preliminary presentation.) Signals like all signs are transactional. If a dog catch sight of the ear of a rabbit and start the chase, signal behavior is involved. The signal is not the rabbit's ear to itself, nor is it the identification mechanism in the dog; it is the particular "fitness" of environment and organism—to use Henderson's word; it is the actual fitting in the performance. Pavlov's conditioned reflex, as distinguished from simple reflexes that can tell their stories directly in terms of physical-physiological excitations and reactions, is typical signalling, and Pavlov's own use of the word "signal" in this connection is the main reason for our adoption of it here. The Pavlov process must, however, be understood, not as an impact from without nor as a production

[9] Symbol as the third level of behavioral sign, and Definition as a symbolic process severed from the designatory process of specification, are not discussed in the present paper. They are non-naming procedures. Present discussion would take much space, and the added complication would increase the difficulties of presentation for our immediate purpose. We here merely call attention to the fact that place must be reserved for their consideration later.

from within, but as a behavioral event in a sense much closer to his own descriptions than is found in many comparable American laboratory inquiries. It must be a feature of the full stimulus-response situation of dog and environmental objects together. If we take bird and berry in place of dog and rabbit, berry is as much a phase of signal as bird is. Divorce the two components—disregard their common system—and there *is* no signal. Described in divorcement the whole picture is distorted. Signaling is always action; it is event; it occurs; and only as occurrence does it enter inquiry as subject-matter. It is not only transactional as between dog and rabbit and between bird and berry, but each instance of it is involved in the far wider connections of the animal's behaviors. No such fact is ever to be taken as an isolate any more than one animal body is to be taken as an isolate from its genus, species, race, and family. If one takes either the sensory, the motor, or the perceptional as isolate one again distorts the picture. Each case of signal, like every other case of sign, is a specific instance of the continued durational sign-activity of life in the organic-environmental locus. The motor phase has its perceptive-habitual aspect, and the perceptive phase has its motor aspect, with training and habit involved.

Designation. Designation differentiates upon a basis in Signaling. The signaling is organic-environmental process that is transactional. Designation in its turn is transactional organic-environmental process, but with further differentiation both with respect to the organism and with respect to the environment. With respect to the organism the "naming" differentiates; with respect to the environment the "named" differentiates. On neither side do we consider detachments as actual. The organism is not taken as a "capacity" apart from its environmental situation. The environment is not taken as "existing" in detachment from the organism. What is "the named" is, in other words, not detached or detachable environmental existence, but environment-as-presented-in-signaling-behavior. In other words, signalings are the "named," even though the namer in naming develops a language-form presumptively presenting an "outer" as detachable. Neither "naming" nor "named" under our procedure is taken as either "inner" or "outer," whether in connections or separations. The process of designation becomes enormously more complex as it proceeds; in it environmental determinations and namings unfold together. We make our approach, however, not in terms of the later, complex specializations, but instead in terms of the growth in its early stages. The *what* that is assumed in the earliest in-

stances is, then, not a *thing* in detachment from men (as most logicians would have us believe); much less is it some "ultimate reality," "provisional reality," "subsistence," or "existence" (whatever such sorts of "things" may be supposed to be). What is "cued" in the earliest forms of naming is some action-requirement within the sign-process, that is, within behavior. When one of a pair of birds gives a warning cry to his mate, or when a man says "woof" to another man as sign of bear-trail or bear-presence, it is behavior that is brought in as named; it is transactionally brought in, and is transaction itself as it comes. One can go so far back along the evolutionary line that the bird-call or the "woof" or some more primitive predecessor of these has, under such observation and report as we can make, not yet reached so much as the simplest differentiating stage with respect to "naming and named." But when the differentiating stage *is* reached, then the "named" that differentiates within the behavior is an impending behavioral event—an event in process—the environing situation included, of course, along with the organism in it. Both bird-call and woof indicate something doing, and something to be done about it.

The transactional locus of a designation in one of its earliest forms is very narrow—just the range of the creatures in communication, and of the sensori-manipulative-perceptive events directly presented in the communication. When and as the designation event develops more complexity, the locus widens. Intermediate stages of namings intervene. Some of them push themselves temporarily into the foreground of attention, but even so are in fact members of a total inclusive transaction, and are given isolation and independence only in theories that depart from or distort observation. One may name a law, say the price-control act, without ever putting one's "finger" on it. In fact our experts in jurisprudence talk indefinitely about a statutory or other law without being able to specify what any law *is*, in a way equivalent to a direct "fingering." And while in this talking and writing about the law, limiting intervening namings become temporarily the focus of direct attention, the *what* that is named is the law in its entire reach.

It is in this transition to more and more complex designations that the descriptive accounts are most likely to go astray. The cry "Wolf" is quickly brought to rest through actions that yield a "yes" or "no." The cry "Atomic Bomb" is evidently on a different level. It is in the cases of highly developed designations that it is most necessary so to take our clue from the simpler cases

as to be firmly and solidly aware that name can not be identified as a process in an organism's head or "mind," and that the named can not be identified with an object taken as "an entity on its own account"; that the naming-transaction has locus across and through the organisms-environments concerned in all their phases; and that it is subject to continued development of indefinite scope so that it is always in transit, never a fixture.

We shall give attention to the two less complex stages of designation, namely, Cue and Characterization, merely far enough to lead up to the presentation of Specification as the perfected (and ever-perfecting) stage of naming, and so as to provide the ground for its differentiation from symbol and definition. So far as the terminology used is concerned, it may seem strange to group the thing-name, Cue, with the action-names, Characterization and Specification, as we are doing. But since all designations are designations in and of behavioral activities, the particular noun-form used does not greatly matter. We might, perhaps, set up Cue, Common Noun, Term [10] as one series of names to range the field; or, as an alternative, we might use Ejaculation, Characterization, and Specification. Provided the behavioral transactions are taken as names with respect to developing action, the selection of terminology may well be left open for the present.

Cue. By Cue is to be understood the most primitive language-behavior. Wherever transactional sign on the signal level begins to show differentiation such that out of it will grow a verbal representation of any signal process, we have the beginnings of Cue. It is not of prime importance whether we assert this as first arising on the sub-human animal level, and say that language there comes into being, or whether we place the first appearance of true language as among men. The general view is that the regions of cue, in contrast with those of signal, are characteristically communicative, but this issue, again, is not one of prime importance. Such questions lie in the marginal regions which modern science (in distinction from older manners of inquiry) does not feel it necessary to keep in the forefront of attention. Life is life, whether we can put a finger on the line that marks the boundary between it and the non-living, or whether a distinction here is far beyond our immediate powers; and much energy will be saved if we postpone such questions till we have the facts. Biology learned about its

[10] Decision as to the use of the word "term" is one of the most difficult to make for the purposes of a safe terminology. Mathematics uses the word definitely, but not importantly. Logics, as a rule, use it very loosely, and with much concealed implication. Later attention to the word will be necessary.

marginal problems from the viruses and could have got along just as well or better without the oceans of opinionative disputation over the "vital principle" in older days.

Illustrations of designation above were mainly from the lower levels and will serve for cue. Cue, as primitive naming, is so close to the situation of its origin that at times it enters almost as if a signal itself. Face-to-face perceptive situations are characteristic of its type of locus. It may include cry, expletive, or other single-word sentences, or any onomatopoeic utterance; and in fully developed language it may appear in an interjection, exclamation, abbreviated utterance, or other casually practical communicative convenience. Though primarily name grown out of signal, it may at times have the guise of more complex name reverted to more primitive uses. We may perhaps say that cue is signal with focal localization shifted from organism-object to organism-organism, but with object still plain in reach.

The transition from signal to cue may be indicated in a highly artificial and wholly unromantic way through a scheme which, fortunately, is devoid of all pretense to authority as natural history. On the branches of a tree live three snakes protectively colored to the bark, and enjoying vocal chords producing squeaks. Transients at the tree are squeaking birds: among them, A-birds with A-squeaks that are edible by snakes, and B-birds with B-squeaks that pester snakes. Bird-squeaks heard by snakes enter as signals, not as bird-squeaks alone, nor as snake-heard sounds alone, but strictly as events in and of the full situation of snake-bird-tree activity. Snake-squeaks, onomatopoeically patterned, are cues between snakes—primitive verbalisms we may call them, or pre-verbalisms. The evolutionary transition from bird-squeaks warning snakes to snake-squeaks warning snakes is not one from external signs to internal signs, nor from the automatic to the mental, but just a slight shift in the stresses of the situation. When cue appears, we have a changed manner of action. When cue is studied transactionally, we change our stress on these subject-matters of inquiry. Our change is slight, and one of growth in understanding, elastic to the full development of inquiry. It is not a breakage such as a self-actional account produces, nor even a set of minor breakages such as interactional treatment involves. The change to transactional treatment permits descriptions such as those on which perfected namings are built up.

The cue-stage of designation was not mentioned in our preliminary sketch of terminology,[11] our arrangement there being designed

[11] This JOURNAL, Vol. XLII (1945), pp. 245–246.

to give preliminary stress to the distinction of definition from specification. Signal was chosen as a name for the perceptive-manipulative stage of sign process largely on the basis of Pavlov's use of it. Cue was chosen for its place because all "dictionary definitions" (except one or two that lack the sign character altogether) make it verbal in nature. It may be, however, especially in view of Egon Brunswik's important recent studies [12] that the words "cue" and "signal" could better be made to shift places. Our purpose here is solely to establish at once the manners of disjunction and of conjunction of cue and signal, and an interchange of names would not be objectionable.

Characterization. Out of cue there develops through clustering of cues—i.e., through the growth of language—that type of naming which makes up almost all of our everyday conversation. It is the region of loose description, most of the time well enough for current practical needs, but that is about all; and the more pretentiously it is used, the less value it has. It is the region where whale in general is a fish because it lives in the water like any "proper" fish. Words cease to be of the type of "this," or "that," or "look," or "jump quick," and come to offer a considerable degree of connection among and across environmental situations, occurrences, and objects. The cues overlap and a central cue develops into a representative of a variety of cues. The interconnections are practical in the colloquial sense of everyday life. Horse is named with respect to the way one does things with and about horses, and with respect to the way horse does things with and about us. The noun enters as an extension of the pronoun (which is a radically different treatment from that of ordinary grammar where the pronoun is said to be a substitute for the noun). The common noun comes to succeed the proper noun. The characterizations move forward beyond the "immediately present" of the cues as they widen their connections, but for the most part they are satisfied with those modes of linguistic solvency which meet the requirements set by an immediately present "practical" contextual situation.

[12] Egon Brunswik, "Organismic Achievement and Environmental Probability," *Psychological Review*, Vol. 50 (1943), p. 255. See also Tolman and Brunswik, "The Organism and the Causal Texture of the Environment," *Psychological Review*, Vol. 42 (1935), p. 43. Both cue and signal overlap in ordinary conversational use, a fact of interest here. George H. Mead occasionally used "signal" in much the region where we use "cue." Mead's treatment of the animal-man border regions will be of interest (*Mind, Self, and Society*, pp. 61–68, 81, *et al.*).

The first great attempt to straighten out the characterizations and bring them under control was perhaps made by the Greek sophists, and these led the way to Aristotle's logic. The logics that have followed Aristotle, even those of today that take pride in calling themselves non-Aristotelian, are still attempting to bring characterizations under the control of rules and definitions—to get logical control of common namings. All theories of linguistics, at least with a rare exception or two, make their developments along these lines. It is in the region of characterization that the view arises that if naming occurs there must exist a "some one" to do the naming; that such a "some one" must be a distinctive kind of creature, far superior to the observed world—a creature such as a "mind" or personified "actor"; and that for such a "some one" to give a name to "anything," a "real" thing or "essence"[13] must exist somewhere apart and separate from the naming procedure so as to get itself named. (The word "must" in the preceding sentences merely reports that where such practical characterizations are established they think so well of themselves that they allege that every form of knowledge "must" adapt itself to them.) Alien as this is from modern scientific practice, it is, nevertheless, the present basis of most linguistic and logical theory and of what is called "the philosophy of science."[14] It is in this stage that namings and the named get detachable existences assigned to them by reflecting or theorizing agents, their immediate users being as a rule protected against this abuse by the controls exercised in conversational exchange by the contextual situation directly present to those who participate in the oral transaction. Indeed, one may go so far as to doubt whether the distorted theory would have arisen if it had not been for the development of written documents with their increasing remoteness from determination by a directly observed situation. Given the influence of written, as distinct from spoken, language, it is dubious whether theoretical or philosophical formulations could have taken any form other than the one they now have, until a high degree of the development of the methods of inquiry now in use in advanced subjects should provide the pattern for the statement in the form we term specification as complementary with transaction.

[13] The recent revival of the word "essence" in epistemological discussion, as in Santayana's writings, is of itself convincing evidence of the statement made in the text.

[14] The difficulties in which the logics find themselves are touched on by one of the writers of the present paper in two papers: "On a Certain Vagueness in Logic," this JOURNAL, Vol. XLII (1945), pp. 6–27 and 39–51; and "Logicians' Underlying Postulations," *Philosophy of Science*, Vol. 13 (1946), pp. 3–19.

Description. Before passing to specification it will be well to attend to the status of names and naming with respect to descriptions. Phrasings develop around namings, and namings arise within phrasings. A name is in effect a truncated description. Somewhat similarly, if we look statically at a stable situation after a name has become well established, a description may be called an expanding naming. The name, in a sense which is useful if one is careful to hold the phrasing under control, may be said to name the description, and this even more properly at times than it is said to name the object. For naming the object does not legitimately, under our approach, name an object unknown to the naming system; what it names is the object-named (with due allowance for the other forms of knowing on the sensori-manipulative-perceptive level of signal); and the object-named is more fully set forth by far in description than by the abbreviated single word that stands for the description. Beebe [15] mentions a case in which a single word, Orthoptera, in the Linnaean scheme precisely covered 112 words which Moufet had required for his description a hundred years earlier. The process of description begins early and is continuous while naming proceeds in its own line of growth, whatever arbitrary substitutes for it may at times be sought. Get two yellow cats and one black cat. Some little while afterwards, culturally speaking (a few tens of thousands of years, perhaps) primitive man will mark the color distinction, not as color for itself, but as color in contrast with other color. Put his color-naming in system with cat-naming, and you have the beginnings of description. "Cat" begins now to stand not merely for anti-scratch reaction, or for cat-stew, but for an organization of words into description. Bertrand Russell and several of his contemporaries have had a great deal of trouble with what they call "descriptions" as compared with what Russell, for instance, calls "logical proper names." Fundamentally Russell's "proper names" are analogues of the cue—reminiscent of primeval yelps and of the essences and entities that descend from them, to which it is that Russell wishes to reduce all knowledge. At the far extreme from his form of statement stands specification as developed out of characterization by expanding descriptions which in the end have attained scientific caliber. It is to Specification rather than to survivals of primitive catch-words that our own procedure directs itself in connection with progress in knowledge.

Specification. Specification is the type of naming that develops when inquiry gets down to close hard work, concentrates experi-

[15] *The Book of Naturalists* (1945), p. 9.

mentally on its own subject-matters, and acquires the combination of firmness and flexibility in naming which consolidates the advances of the past and opens the way to the advances of the future. It is the passage from conversational and other "practical" namings to namings that are likewise practical—indeed, very much more practical—for research. The whale ceases to be a fish on the old ground that it lives in water and swims, and becomes established instead as a mammal because of characterizations which are pertinent to inquiries covering wide ranges of other animals along with the whale, bringing earlier "knowns" into better system, and giving direction to new inquiries. "Fish," as a name, is displaced for whale, not because it fails to conform to "reality," but because in this particular application it had been limited to local knowings which proved in time to be obstructive to the further advance of inquiry in wider ranges. Scientific classificatory naming, as it escapes from the bonds of rigidity, illustrates the point in biology. In physics it is illustrated by the atom which ceases to be a little hard, round, or cubical "object" that no one can make any smaller, harder, or rounder, and has become instead a descriptive name as a kind of expert's shorthand for a region of carefully analyzed events. Incidentally this procedure of specification is marked by notable inattention to the authority so often claimed for ancient syllogistic reasoning carried on in patterns fixed in advance.[16] The surmounting of the formal or absolute space and time of Newton, and the bringing of space and time together under direct physical description, is the outstanding illustration of the work of specification in recent physics, and our account in a preceding paper [17] of the advance of transactional presentation of physical phenomena might in large part have been developed as a report upon specification. The developmental process in "science" is still far from complete. In biological work organism and object still often present themselves in the rough as characterizations without specification, even though much specification has occurred in the case of physiological inquiry. In psychological and societal subject-matters procedures are even more backward. It is astonishing how many workers in these latter fields relegate all such issues to

[16] The issues, of course, are of the type so long debated under the various forms of contrast between what is called empiricism and what is called rationalism, these names merely marking the condition surrounding their entry into specialized modern prominence. Such issues are, however, held down by us to what we believe we are able to report under direct observation of the connections between language and event in current scientific enterprise in active operation.

[17] This JOURNAL, Vol. XLIII (1946), p. 505.

"metaphysics" and even boast that they are "scientific" when they close their eyes to the directly present (though unfortunately most difficult) phases of their inquiry.

In our preliminary account of naming generally, we have said that it states and connects. Cue states and characterization connects. Specification goes much further. It opens and ranges. By the use of widened descriptions it breaks down old barriers, and it is prepared to break down whatever shows itself as barrier, no matter how strongly the old characterizations insist on retention. What it opens up it retains for permanent range from the furthest past to the best anticipated futures. Also it retains it as open. It looks back on the ancient namings as at least having been designational procedure, no matter how poor that procedure was from man's twentieth-century point of view. It looks upon further specifications as opening a richer and wider world of knowledge. In short it sees the world of knowledge as in growth from its most primitive forms to its most perfected forms. It does not insert any kind of a "still more real" world behind or beneath its world of knowledge and fact.[18] It suspects that any such "real" world it could pretend to insert behind the known world would be a very foolish sort of a guessed-at world; and it is quite content to let full knowledge come in the future under growth instead of being leaped at in this particular instant. It welcomes hypotheses provided they are taken for what they are. Theories which sum up and organize facts in ways which both retain the conclusions of past inquiries and give direction to future research are themselves indispensable specifications of fact.

Specification, as we thus present it, *is* science, so far as the word "science" is used for the reporting of the known. This does not mean that out of the word "science" we draw "meanings" for the word "specification," but quite the contrary. Out of a full analysis of the process of specification we give a closer meaning to the word "science" as we find it used in the present era. Scientists when confronting an indeterminacy alien to classical mechan-

[18] Philipp Frank, *Between Physics and Philosophy* (1941), using a terminology and a psychological base very different from ours, writes: "Our modern theoretical physics, which admits progress in all parts of the symbol system, is skeptical only when viewed from the standpoint of school philosophy" (p. 102); "There are no boundaries between science and philosophy" (p. 102); "Even in questions such as those concerning space, time and causality, there is scientific progress, along with the progress in our observations" (p. 102); "The uniqueness of the symbol system can be established within the group of experiences itself without having recourse to an objective reality situated outside, just as the convergence of a sequence can be established without the need of discussing the limit itself" (p. 84).

ics, may seem as agitated as if on a hot griddle for a month or a year or so; but they adapt themselves quickly and proceed about their business. The old characteristics did not permit this; the new specifications do; this is what is typical of them. There is a sense in which specification yields the veritable object itself that is present to science; specification, that is to say, as one aspect of the process in which the object appears in knowledge, while, at the same time, the object, as event, yields the specification. It is not "we" who are putting them together in this form; this is the way we find them coming. The only object we get is the object that is the result of inquiry, whether that inquiry is of the most primitive animal-hesitation type, or of the most advanced research type. One of the writers of the present paper has examined this process of inquiry at length on its upper levels—those known as "logic" —and has exhibited the object in the form of that for which warranted assertion is secured.[19]

The scientific object, in this broad sense, is that which *exists*. It reaches as far into existence as the men of today with their most powerful techniques can reach. In our preliminary suggestions for terminology we placed event in contrast with designation as the existential aspect of fact. We would greatly prefer to place the word "existence" where we now provisionally place event, and shall probably do so when we are ready to write down the determinations at which we aim. Exist, the word, is derivative of the Latin *sto* in its emphatic form, *sisto*, and names that which stands forth. What stands forth requires temporal and also spatial spread. Down through the ages the word "existence" has become corrupted from its behavioral uses, and under speculative philosophy has been made to stand for something which is present as "reality" and on the basis of which that which is "known" is rendered as "phenomenon" or otherwise to the knower. Common usage, so far as the dictionaries inform us, is heavily on the etymological and common-sense side of the issue, though, of course, the philosophical conventions get their mention. The common man, not in his practical use, but if asked to speculate about what he means, would probably offer his dogmatic assurance that the very "real" is what exists. *Solvitur ambulando* is a very good practical solution of a practical question, but *solvitur* in the form of a dogmatic assertion of reality is something very different. Dr. Johnson (if it was Dr. Johnson) may kick the rock (if it was a rock), but what he demonstrates is kicked-rock, not rock-reality, and this only within the linguistic form then open to him. We believe we have

[19] John Dewey, *Logic, the Theory of Inquiry* (1938); see p. 119.

ample justification for placing existence where we now place event in our terminological scheme—only delaying until we can employ the word without too much risk of misinterpretation by hearer or reader. If, however, we do this, then specification and existence are coupled in one process, and with them science; though again it must be added, not science in a purely "physical" or other narrow rendering of the word, but science as it may hope to be when the best techniques of observation and research advance into the waiting fields.

The passage from characterization to specification is not marked by any critical boundary. Nor is the passage from everyday knowledge to scientific knowledge, nor that from everyday language to scientific language. Our attention is focused on lines of development and growth, not on the so-called "nature" of the subject-matter of inquiry. If we are wrong about observing events in growth, then the very inquiry that we undertake in that form should demonstrate that we are wrong. Such a demonstration will be more valuable than mere say-so in advance that one should, or should not, make such an attempt. The regions of vagueness remain in specification, but they decrease. They are Bridgman's hazes. Their main implication is, however, transformed. The earlier vagueness appeared as defects of human capacity, since this latter did not seem to succeed in reaching the infinite or the absolute as it thought it ought to. The newer vagueness, under the operation of specification, is a source of pride. It shows that work to date is well done, and carries with it the assurance of betterment in the future.

It is common for workers who favor what is called "naturalism" to accept, with qualification, many phases of the development above. We are wholly uninterested in the phases of the "ism," and solely concerned with techniques of inquiry. For inquiry into the theory of knowledge, to avoid wastage and make substantial progress, we believe the attitude indicated must be put to work one hundred per cent, and without qualification either as to fields of application or ranges of use. We have, however, not yet discussed the manner in which symbol and definition, which we do not permit to interfere with designation, may be put to work in the service of the latter. Nor have we shown the intimate connection between the techniques of specification and the establishment of transmission as permissible immediate subject-matter and report. To these subjects we shall return in a later paper.

JOHN DEWEY
ARTHUR F. BENTLEY

A GENERIC THEORY OF TIME [1]

THERE is no theory of time that is wholly free and unattached from special metaphysical and philosophical interests and prejudices. The task of the subsequent reflections is to suggest a theory which is free from philosophical presuppositions and which, in contrast with these other views, promotes the generic character of time.

What is needed is a theory of time which is valid even if we reject certain metaphysical systems and views regarding nature; and one holding for all possible structures and constituents, and for all worlds, actual and possible. It is our aim to present such a theory as would make time neither affected by the peculiar substance and nature of things, nor *infected* by their qualities. The generic theory will present its claims without presupposing any metaphysics or any philosophic attachments. This means that a theory is made independent of any definite attachment to any metaphysical orientation. Why should a theory of time be enthralled to special philosophic interests and prejudices? It is our task to give such a theory as would satisfy the ontologist as well as the phenomenologist, regardless of any such ultimate categories as will, satisfaction, self-completion, *élan vital,* etc.

When I see the swaying of leaves on a lonely willow or the scudding of clouds, I need not inquire as to the cause of these events to apprehend the temporal. What is necessary and sufficient is that a certain definite state of affairs was displaced, and a new one has come into being. The concept "state of affairs" is wide enough in its connotation to cover such situations as the movement of clouds, leaves, shadows, the orbits of electrons, and to apply to any structure of any actual or possible world. It would make little difference whether the world be made up of point-forces or of homogeneous vapor.

Following the practice of the physical sciences we shall adopt the neutral word "displacement" to connote a transition *from* one phase *to* another. This term is devoid of qualitative content. It makes no distinction between the experiential and the non-experienced aspects of nature. It is necessary to use it if we are to give such a definition of time as is common to all situations, whether they be the succession of sensations or the change of energy level of an atomic system. *Time is a relation connecting phases of situations which persist or displace one another.*

Each metaphysical system is at liberty to define or to accept its

[1] Read at the meeting of the Western Division of the American Philosophical Association, University of Chicago, May 10, 1946.

own notion of "state of affairs"; all we ask of any of these systems is that it should not leave out the notion of displacement, so as not to yield a purely spatial world. We are not in this paper contesting the worth nor the validity of any metaphysics; each one may enjoy, to use Santayana's phrase, eternal plausibility.

Displacement is not to be thought of solely in a spatial meaning, and not restricted to motion alone, as is commonly supposed. To do so would tether us to a mechanical metaphysics according to which motion is ultimate as regards the genesis of events, and hence of time. Displacement is more general than motion; the latter involves a displacement with respect to position, as well as an organic act of moving. Time is produced or engendered by the throbbing of entities; it is *not the displacement* of a situation. It *ensues from displacements*. This is a very important distinction connoting the insubstantial character of time. Time is not substance, nor a sensuous and Platonic essence; hence it does not pass, nor does anything pass in it. The passage or flux is a character qualifying the state of affairs of the actualities or essences that go to make up the world, actual or possible. The pathos of the denial of any form and substantiality to time is catastrophic to the view of time as the "form of perception" or "form of intuition." Only things extended have sensuous form, whether they be bodies, images, sensa, patches of color, etc. We can not cling forever to a metaphysics that holds matter and form to exhaust the possible existents and relations in an actual and possible world. Time is the purest and most unique relation not infected by the nature of the situations by which it is engendered.

The generic theory of time recognizes no distinction between so-called "lived" time and the "dead" physical time. Surely there is time involved in the thinking of a scientist, in the esthetic enjoyment of a landscape painting, as well as in the emission of energy from far off stars. The time engendered by one situation is qualitatively no different from that of the other; *time has no quality*. It is the events themselves that are either qualitative or not. The distinction lies rather within the diversity of the types and kinds of events existing in the world than between the times intrinsic to each occurrence. I am not denying the difference between the experienced and the non-experienced aspects of nature, but am only maintaining that these qualitative distinctions lie wholly within the diversity of the events concerned, and not as between their respective times. Philosophers are often guilty of ascribing to time the whole gamut of qualities found in concrete situations. Howsoever diverse phenomena are in this and in any possible world has little bearing on time. Time is the most com-

mon denominator of all types of displaced situations and entities, whether they be sandstorms in the desert or the yearning of a lost sheep.

Time is neither contentual nor substantial, but not necessarily empty. It need not be qualitative and yet can be concrete in the sense of being inseparable from the actual displacements and throbs. If it were empty it would be totally divorced from an actual world. *There are only private or intrinsic times,* those engendered by actual particular processes. Each throb, pulsation, and displacement is unique in the sense that an entity can not have others pulsate or throb by proxy. Just as space is cointensive with the actual entities that make up the world, time is cointensive with the actual displacements that occur. It is John's swimming that "takes" one-half hour, the violinist's solo that "takes" twenty minutes; there is no unit of time unattached to any event. Events do not occur in time, since the latter is not an absolute continuum existing apart from pulsating existents and releasing portions of its whole being to be wedded to events.

Let us now see some of the consequences that can be drawn from our theory.

Persistence and the Time Quantum. Permanence and flux are commonly thought of as antithetical to each other. That this is not the case is evidenced by the fact that flux may be permanent, as in the instance of a flowing stream. Permanence pertains to situations, whether they be static or in flux. In short, permanence may qualify fluent and static states of affairs. We speak of constant and continuous flux and of bodies permanently at rest, whether it be possible or not. The two opposites are *staticity* and *flux;* the concept "lastingness," "endurance," or "persistence" applies to both. It is obvious that a situation is static if it suffers no displacement, no quiver, and no transience from one phase to another. In order for time to be generated and to ensue, it is necessary that the staticity of the world endure but for a *finite* or bounded stretch; otherwise a purely spatial world would result. Suppose a man is motionless while the hour hand makes one complete revolution. It can be said, then, that his state of rest *persisted* for one hour, i.e., it was simultaneous with a definite number of events of equal temporal stretch. Thus the persistence of a static situation is measured by a flux, such as the motion of the minute hand.

Flux and staticity refer to situations and states, as well as to entities, as, for example, the motion of bodies, the change of qualities, the variation of properties of bodies, etc. Suppose there were only continuous flux, and no situation or property could endure

even for the smallest stretch of time. The reader can imagine himself watching a kaleidoscopic display of colors on a rotating wheel; and now suppose no color were to persist for the smallest duration. This could only mean that the time "taken" by the color is of zero extension, and hence an instant of time is the duration of each. We would thus revert to the extensionless instants of Newtonian time. But the sum of these instants could never yield an extension, the latter being characterized by a transience from one phase to another. It follows, therefore, that continuous flux within which things, qualities, situations, and events do not persist for at least a minimal time-stretch, resolves itself into staticity; and we also fall back to the conception of time as independent of displacements and made up of extensionless points. Thus there could be no flux without persistence; they are dual and complementary—not polar-characters of a pulsating world. One can not subsist without the other unless we wish to commit ourselves to a metaphysical contradiction or to a timeless world.

"The temporal fact is not the passage of events, but the occurrence of changes in persistent substantial individuals." [2] With this thought we wholeheartedly concur; in our thesis, however, the meaning of persistence is broadened to pertain to static as well as to fluent situations. The genesis of time is not limited solely to changes of individuals. The displacement of any situation, whether it be an image, a shadow, a chunk of cloud—all of these, and not merely "substantial individuals" partake of the birth of time. Qualities, situations, events, and entities persist for a finite temporal stretch, howsoever small; this is the real basis of the notion of the quantum of time cautiously introduced by modern physics.

Despite the essential disparateness between space and time, there are certain relations valid for both space and time; in short, there exists a principle of duality operating with respect to both. Time we held to be intrinsic to actual pulsation; we called such time private. An actual temporal stretch is *undivided;* it is engendered and "enjoyed" as a solid continuum. If I move my arm from one shoulder to the other, the time stretch of this movement is a whole cointensive with the motion and not divided into parts. A temporal stretch is *divisible,* however, into a *finite* number of parts each of which is a concrete stretch for some actual event or process. Each of this finite number of subordinate parts could serve as a duration for some actual event or process. The term "actual" precludes the possibility of such indefinite division as would produce temporal magnitudes not possessed by extant processes. Since

[2] Paul Weiss, *Reality,* p. 208.

this number is finite and there are *no instants of time,* and *no empty time,* there is a lower limit below which a subdivision could not serve as a duration for an actual process. Such an irreducible chunk of temporal extension of actual events we shall call a *time quantum.* Time is just as discrete as space. The temporal continuum is thus *atomized* by undivided wholes and *quantified* by the irreducible durations.

The size of the time quantum is not to be thought of as possessing a rigid and an eternally immutable value for all futurity and for all environments.[3] It suffers fluctuations, depending on the stability conditions of the proximate environment. The quantum, however, can still be regarded as irreducible; for, given a specific determinate stable environment, there is a corresponding uniformity in the size of this quantum for some actual pulsation within *this* environment.

We can now generalize the concept of space to include anything that has *content* or *spread,* as for instance shadows, brain processes, energy, and physical bodies. By space we shall mean any content that is subject to pulsation and displacement. The becomingness of nature would, on this generalization, be the succession and persistence of phases of space, a fluent continuum of spatial states. It is only thus that we can speak of the world as a spatio-temporal continuum. We can derive the meaning of such concepts as instant, point, infinite space, and infinite time, in the following way: Space and time, as we learned,[4] are both discrete, i.e., there are irreducible chunks of spatial and temporal extension; in the case of space it is the cell, the time quantum in the case of time. It is evident that the product of a volume of space by a temporal stretch is equal to a constant. Symbolically it would read: $S \cdot T = k$; where S stands for generalized space, T stands for time, and k is an undetermined constant. These relations are of the same form and intent as the celebrated relations of Heisenberg involving energy and time. According to the latter the product of the uncertainty of time and energy is greater than or equal to Planck's constant h.

From the aforementioned relations it follows that an instant of time *corresponds to* and *is implied in* an infinite amount of energy and an infinite spatial spread out. A point of space *corresponds to* and *is implied in* an infinite stretch of time. The infinity or indefiniteness of either space or time is *complementary* and conjugate to a point (of space) or an instant (of time); this relation

[3] G. I. Pokrowski, *Nature* (1931), pp. 127, 667.

[4] See the author's "Discrete Real Space," this JOURNAL, Vol. XXXVIII (1941), pp. 518–525.

is reciprocal. There is no instantaneous cross-section of the world, unless the latter be infinite in extent or in amount of energy. A point of space "exists" throughout all time; and an instant of time throughout all space. But such a situation would prevail only in a static world. Hence there are no points and instants in a pulsating world, and it is questionable whether points could exist even in a purely spatial one. Thus we have shown it possible to arrive at the notions of time quantum and indeterminacy relations solely from the generic traits of existence. The notions of simultaneity, irreversibility, and periodicity, the cardinal categories of time, will be dealt with on another occasion.

ERWIN BISER

UNIVERSITY OF KANSAS CITY

BOOK NOTE

The Nature of Metaphysical Thinking. DOROTHY M. EMMET. London: Macmillan and Co., Ltd. New York: The Macmillan Company. 1945. xi + 238 pp. $3.00.

The object of this work is to analyze the analogical basis of metaphysical thinking. The author is committed to the thesis that metaphysics "takes concepts drawn from some form of experience or some relation within experience, and extends them either so as to say something about the nature of 'reality,' or so as to suggest a possible mode of co-ordinating other experiences of different types from that from which the concept was originally derived" (p. 5). The metaphysical function of analogy is first of all distinguished from the mathematical type of analogy (the "root meaning," i.e., proportion), and the inductive type or "argument from parallel cases." Certain types of metaphysical analogy are rejected by the author as illegitimate. Among these is the "projective analogy" which seeks to pass from the phenomenal to the transcendent noumenal. It is argued that a legitimate use of metaphysical analogy requires that the transcendent be conceived as lying, in some sense, within the range of experience (not " 'beyond' or 'outside' any possible experience").

In order to establish this general thesis the author discusses various aspects of the whole range of contemporary philosophy. Certain summary passages will serve to indicate the character of the argument. The author's position with respect to "pure phenomenalism" is stated as follows:

> But we shall differ from pure phenomenalism in stressing the *responsive* character of experience, and by "responsive" will be meant that experience

will be described as arising out of situations in which the subject is related to activities other than his own interpretative activity. We shall look for a meaning of "transcendent" in terms of the implication of elements *other* than itself in a subject's activity, and not in terms of some unknowable "noumenal reality" behind the veil of phenomena. [P. 40.]

Following Whitehead[1] and Heidegger, the author accepts the doctrine of a "pre-animistic" stage underlying experience. Consequently,

we do not start from projecting modes of our consciousness, or analogies of our own activities, on to a world beyond us. We start from a consciousness of ourselves as arising out of *rapport*, interconnection and participation in processes reaching beyond ourselves. [P. 65.]

It is in this light that the author interprets scientific models as "illustrative analogies," denying both that they are "mere conventions," and that they are "realistic interpretations." Scientific models are "ways of symbolizing possible modes of connections between things" (p. 91). Our scientific knowledge, in general, although a "distortion" of nature, is, nevertheless, a systematic distortion, because

if we act as if we could assume some sort of concomitant variation between our most carefully controlled observations and their differential conditions in nature beyond us, we are able to predict accurately and bring coherence into further ranges of otherwise disconnected observations. [P. 91.]

From this point on, the author surveys critically the use of analogy in religious thought, theology, and metaphysics. (An entire chapter is devoted to the analysis of the Thomistic philosophy of the Analogy of Being.) The author's major thesis emerges clearly in this context: just as there exists a form of analogy between percepts and that which they symbolize, so some "looser form of analogy" exists which expresses the "appropriateness of response in non-literal symbolism" (p. 170). The burden of the argument is then borne by the notion of "appropriateness," or Whitehead's theory of "importance."

The basic insight of judgment of importance provides an impulse to achieve some coherent and wider co-ordination of experience with reference to it. How far this is successful depends on the driving power of the original experience, and on the metaphysician's power of sustained constructive thought. [P. 194.]

The greatest weakness of this work is its failure to discuss in an adequate fashion the relation of analogy to either scientific or metaphysical truth. To be sure, analogy has been used effectively

[1] An interesting discussion of Whitehead's theory of "prehensions" is included as an appendix to the volume.

in scientific inquiry, but scientific truth is its objective. The validity of a scientific theory does not seem to reside in the analogy from which the theory was derived. The claim that metaphysics uses analogy in its thinking about the world has been pretty generally admitted. The critical question is how metaphysics, by the use of analogy, attains theories which are true.

J. G.

OTHER NEW BOOKS AND JOURNALS

Coomaraswamy, Ananda K.: Figures of Speech or Figures of Thought. Collected Essays on the Traditional or "Normal" View of Art. Second Series. London: Luzac & Co. 1946. 256 pp. 10/6.

Reiser, Oliver L.: Scientific Humanism. Its Origins, Teachings, and Social Program. An Outline of the Philosophy That May Provide a Basis for the Integration of the World's Great Cultures. Girard, Kansas: Haldeman-Julius Publications. 1946. 15 pp.

Shewring, Walter: Art in Christian Philosophy. Plainfield, New Jersey: The Sower Press. 1946. 21 pp.

THE JOURNAL OF SYMBOLIC LOGIC. Volume 11, Number 3. A Boolean derivation of the Moore-Osgood theorem: *Archie Blake.* On relations as coextensive with classes: *W. V. Quine.* Note on a conjecture of Skolem: *E. L. Post.*

PHILOSOPHY AND PHENOMENOLOGICAL RESEARCH. Vol. VII, No. 1. The Different Trends of Contemporary French Philosophy: *Gaston Berger.* Positivism and Materialism: *R. W. Sellars.* Johann Joachim Winckelmann and the Three Epochs of the Bourgeois Weltanschauung: *Mikhail Lifshitz* (translated from the Russian). Briefe Franz Brentanos an Hugo Bergmann: *Franz Brentano,* edited by Hugo Bergmann. Discussions—A Question: On the Impossibility of Possibility, on the Unnecessariness of Necessity, and on the Reality of Reality: *Jean Wahl.* On the Interpretation of Modalities: *Paul Kecskemèti.*

THE PHILOSOPHICAL REVIEW. Vol. LV, No. 5. The problem of Philosophic Method: *E. A. Burtt.* On Quality, Space, and Time: *Max Rieser.* Discussion—Our Knowledge of Other Minds: *Julius Weinberg.* The Relation of Philosophy and Religion: *G. F. Thomas.* Some Questions about Donald Williams' Defense of Materialism: *Max Black.* Rejoinder to Professor Black: *Donald Williams.*

MIND. Vol. LV, No. 220. The Contrary-to-fact Conditional: *R. M. Chisholm.* The Existence of Material Objects: *A. H. Basson.*

Contradiction and the Presupposition of Existence: *E. J. Nelson.* Analysis of "Correct" Language: *Yehoshua Bar-Hillel.* Discussion—Achilles and the Tortoise: *P. C. Jones.*

JOURNAL OF THE HISTORY OF IDEAS. Volume VII, Number 4. Leibniz Tercentenary Issue. Leibniz's Message to Us: *W. H. Sheldon.* Leibniz's Judgments of Fact: *L. E. Loemker.* Leibniz's Greatest Discovery: *Charles Hartshorne.* Leibniz's Theory of Space: *F. S. C. Northrop.* Leibniz's Attack on the Cartesian Doctrine of Extension: *J. W. Nason.* Leibniz's Principles of International Justice: *Paul Schrecker.*

PHILOSOPHIC ABSTRACTS. Volume VI, Number 21–22.

REVUE PHILOSOPHIQUE DE LOUVAIN. Tome 44, No. 2. Comment Aristote conçoit-il l'immatériel? *Gérard Verbeke.* La technique de la logique combinatoire (*suite et fin*): *Robert Feys.* Hillel ben Samuel, philosophe du XIII[e] siècle: *Werner Peetera.* L'existentialisme de M. Sartre est-il un humanisme? *Alphonse De Waelhens.* A propos de dialectique transcendantale: *Nicolas Balthasar.*

NOTES AND NEWS

The following appointments have come to our attention: Nelson Goodman, Associate Professor of Philosophy at the University of Pennsylvania; Arthur W. Burks, Assistant Professor of Philosophy at the University of Michigan; Frederick Harris, Assistant Professor of Philosophy at Cleveland College; Henry Magid, instructor in philosophy at the College of the City of New York; Bernard Diggs, instructor in philosophy at the University of Illinois; John Cooley, instructor, and Joseph Blau, lecturer, at Columbia University; John Smith, instructor in religion at Barnard College.

The University of North Carolina offers for the academic year 1947–1948 a number of graduate fellowships in philosophy, approximately seven (Kenan Fellowships and Williams Fellowships). The stipend is $750.00. Applications should be addressed to the Graduate School, University of North Carolina, Chapel Hill, N. C.